

# THE JOURNAL OF AGRICULTURAL SCIENCE

EDITED BY

PROFESSOR SIR R. H. BIFFEN, M.A., F.R.S., School of Agriculture, Cambridge  
E. M. CROWTHER, D.Sc., F.I.C., Rothamsted Experimental Station,  
Harpenden

J. HAMMOND, M.A., D.Sc., F.R.S., School of Agriculture, Cambridge

H. HUNTER, M.A., D.Sc., School of Agriculture, Cambridge

B. A. KEEN, D.Sc., F.R.S., Rothamsted Experimental Station, Harpenden

F. H. A. MARSHALL, C.B.E., Sc.D., LL.D., F.R.S., School of Agriculture,  
Cambridge

SIR E. J. RUSSELL, D.Sc., F.R.S., Campsfield Wood, Woodstock, Oxon.

IN CONSULTATION WITH

PROFESSOR B. T. P. BARKER, M.A., Agricultural and Horticultural Research Station, Long  
Ashton, Bristol

DR I. B. POLE-EVANS, C.M.G., Department of Agriculture, Pretoria, South Africa

PROFESSOR J. HENDRICK, B.Sc., F.I.C., Marischal College, Aberdeen

DR A. E. V. RICHARDSON, C.M.G., M.A., Commonwealth Council for Scientific and Industrial  
Research, Melbourne, Australia

DR H. J. WHEELER, American Agricultural Chemical Co., Agricultural Service Bureau,  
419 Fourth Avenue, New York, U.S.A.

VOLUME XXXVII 1947

CAMBRIDGE  
AT THE UNIVERSITY PRESS

1947

*Printed in Great Britain at the University Press, Cambridge  
(Brooke Crutchley, University Printer)  
and published by the Cambridge University Press  
(Cambridge, and Bentley House, London)  
Agents for U.S.A., Canada, and India: Macmillan*

## CONTENTS

### PART I (JANUARY 1947)

	PAGE
CASHEN, ROSE O. The influence of rainfall on the yield and botanical composition of permanent grass at Rothamsted. (With Four Text-figures) . . . . .	1
ANDERSON, JAMES. Some factors affecting the pH change in bull semen. (With One Text-figure)	11
DION, H. G., MANN, P. J. G. and HEINTZE, S. G. The 'easily reducible' manganese of soils. (With Seven Text-figures) . . . . .	17
HEINTZE, S. G. and MANN, P. J. G. Soluble complexes of manganic manganese. (With One Text-figure) . . . . .	23
LEES, H. A simple automatic percolator. (With Plate 1 and One Text-figure) . . . . .	27
CHAPMAN, G. W. Rapid semi-micro volumetric estimation of potash in leaf ash . . . . .	29
BARTLETT, S. and BLAXTER, K. L. The value of urea as a substitute for protein in the rations of dairy cattle. I. Field trials with dairy cows. (With Three Text-figures) . . . . .	32
BRAUDE, R. The effect of feeding iodinated casein to pigs . . . . .	45
HOLMAN, W. I. M. and GODDEN, W. The aneurin (vitamin B <sub>1</sub> ) content of oats. I. The influence of variety and locality. II. Possible losses in milling . . . . .	51
THOMAS, BRYNMOR and IBBOTSON, COLIN F. A note on the digestibility of <i>Molinia coerulea</i>	58
RUTLEDGE, W. A. and COMMON, R. H. The composition and digestibility of Northern Irish hays. I. Unthreshed and threshed ryegrass and crested dogstail hays as saved for seed.	60
BURKHARDT, JOHN. Transition from anoestrus in the mare and the effects of artificial lighting	64
TOSIC, J. and WALTON, ARTHUR. Effect of egg-yolk and its constituents on the respiration and fertilizing capacity of spermatozoa. (With Eight Text-figures) . . . . .	69
FERGUSON, W. S. Marrow-stem kale silage . . . . .	77
WOODMAN, H. E. and EVANS, R. E. The nutritive value for pigs and ruminants of dried penicillin felt . . . . .	81

### PART 2 (APRIL 1947)

WOODMAN, ROWLAND MARCUS and JOHNSON, DELPHINE AINSLIE. The effect of time of sowing and water supply on the bolting and growth of lettuce. (With One Text-figure).	95
CALLOW, E. H. Comparative studies of meat. I. The chemical composition of fatty and muscular tissue in relation to growth and fattening. (With Nine Text-figures) . . . . .	113
FORSYTH, W. G. C. The characterization of the humic complexes of soil organic matter . . . . .	132
HOWARD, H. W. Meiotic irregularities in hexaploid oats. I. Univalent frequencies in spring × winter variety hybrids of <i>Avena sativa</i> . (With Thirteen Text-figures) . . . . .	139
BARTON MANN, T. Chick rearing. X. Roughage and protein as dietary factors influencing coccidiosis in chicks, with notes on the limitation of sulphamezathine in the control of coccidiosis. (With Plates 2 and 3) . . . . .	145
DERMOTT, W. and TRINDER, N. Brown heart in swedes: a Cumbrian survey . . . . .	152
KEMP THORNE, O. Recent developments in the design of field experiments. IV. Lattice squares with split plots . . . . .	156